ORTHOPEDICS NUMBER—YEARLY INDEX

THE JOURNAL OF THE AMERICAN OSTEOPATHIC ASSOCIATION

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FOR CONTINUOUS SUPPORT OF OSTEOPATHIC EDUCATIONAL INSTITUTIONS

At the Fifty-Second Annual Meeting of the American Osteopathic Association held last month in Boston, the members of the Board of Trustees and the House of Delegates, representatives of the profession at large, voted unanimously to support osteopathic education and to carry on the Osteopathic Progress Fund effort in cooperation with the six approved osteopathic colleges.

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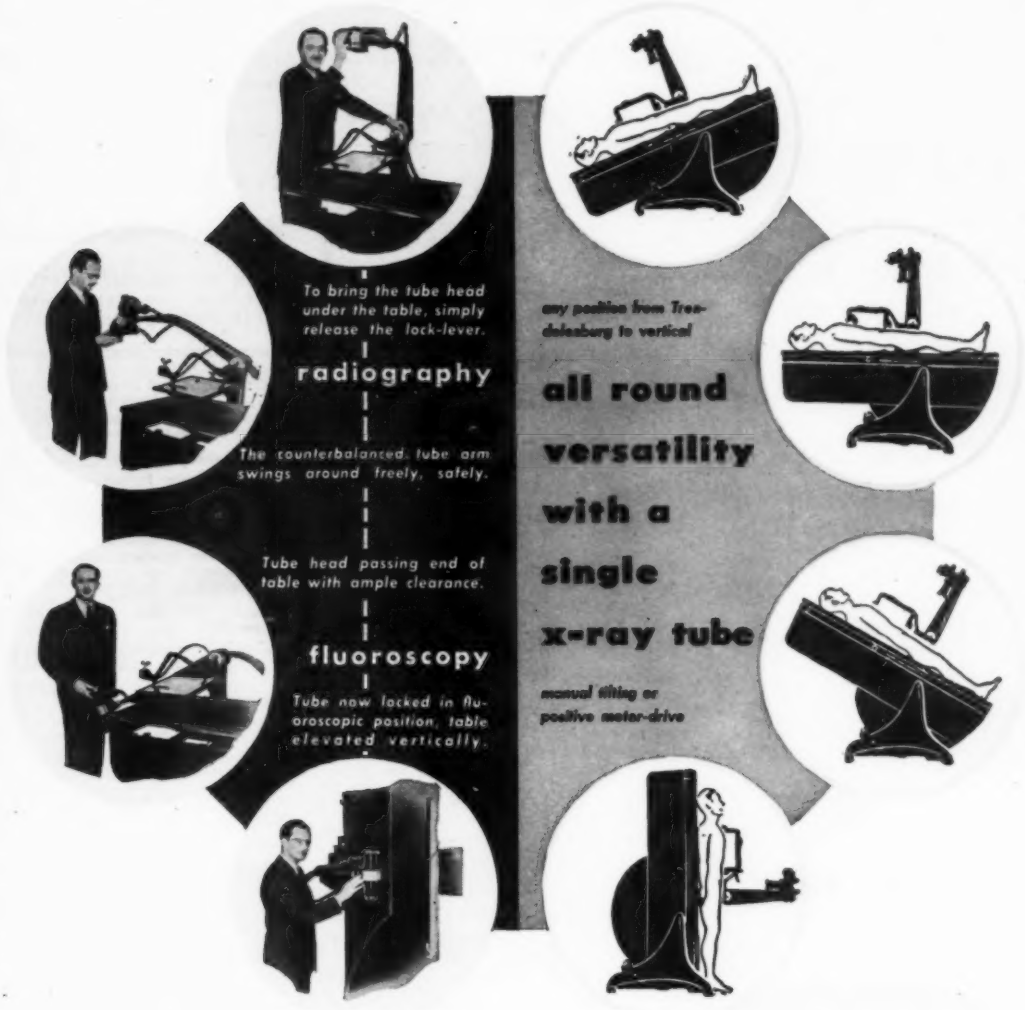
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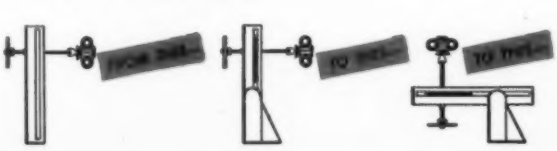

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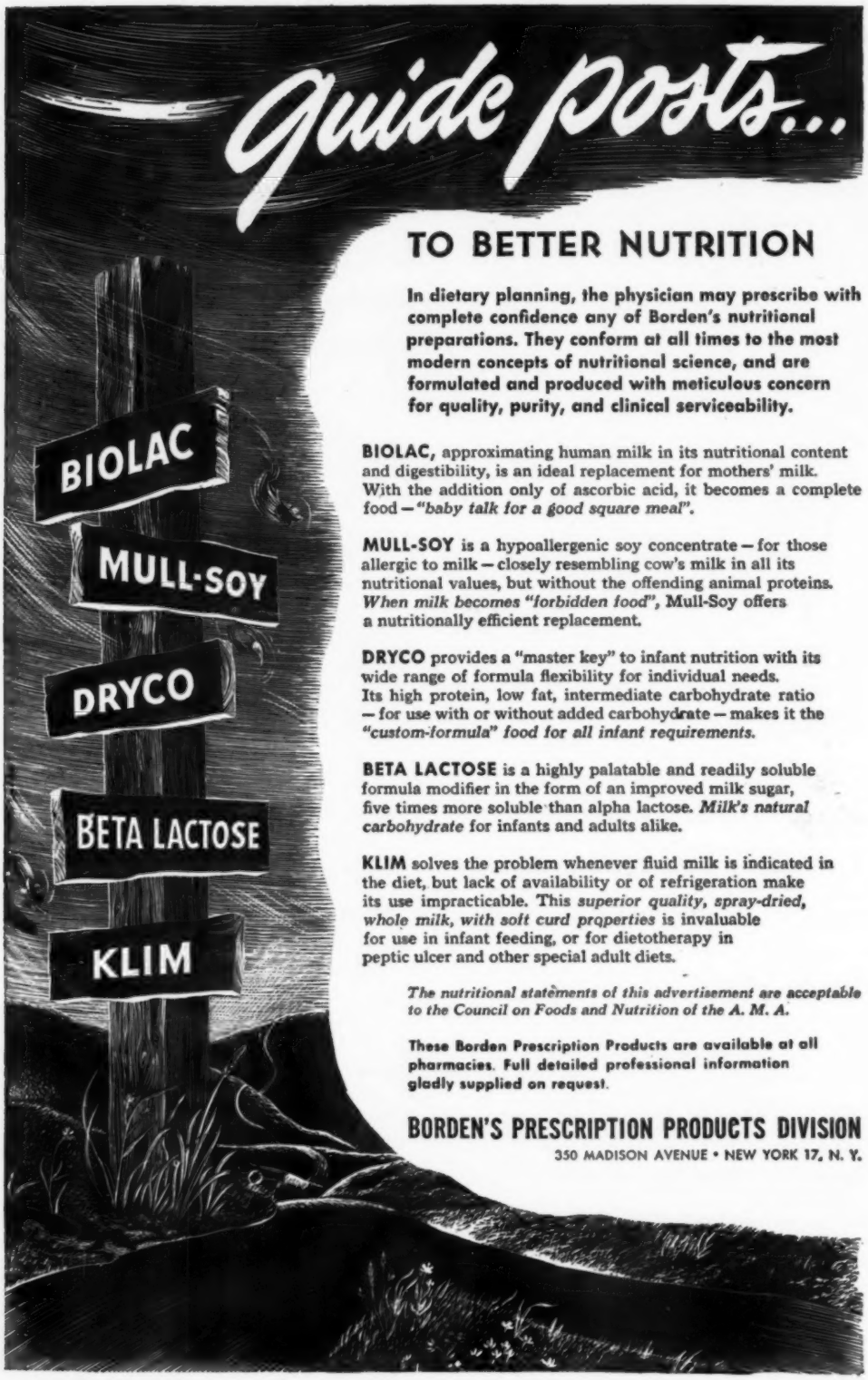

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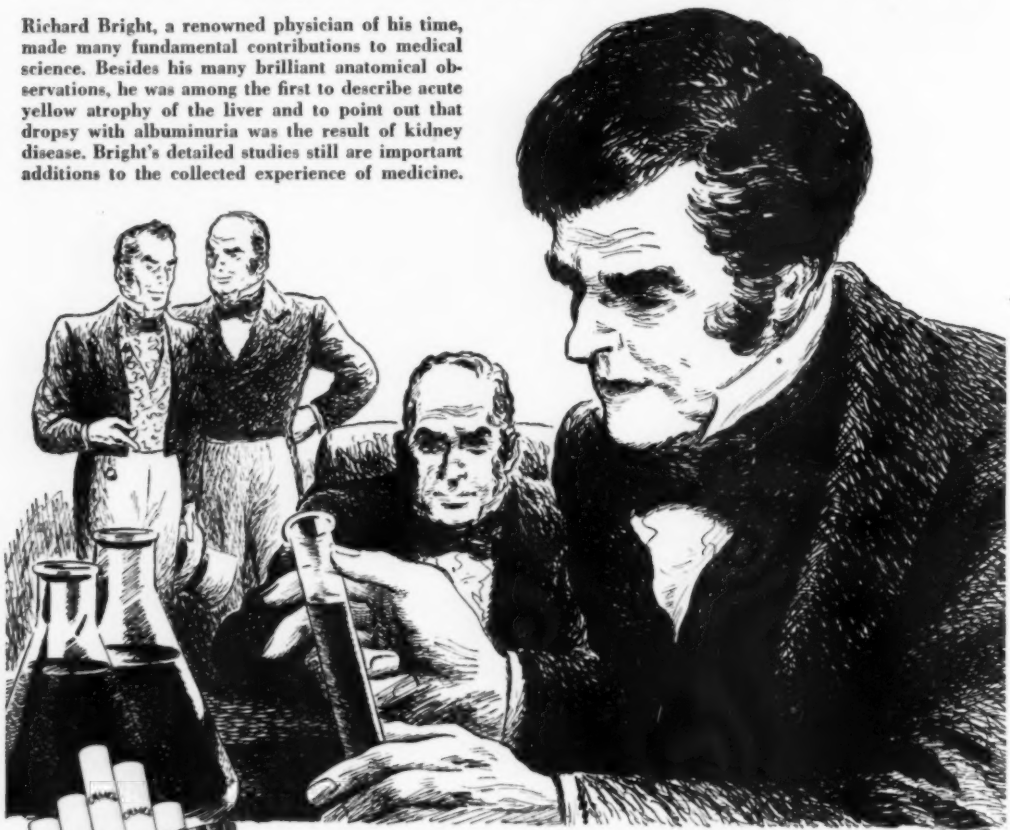

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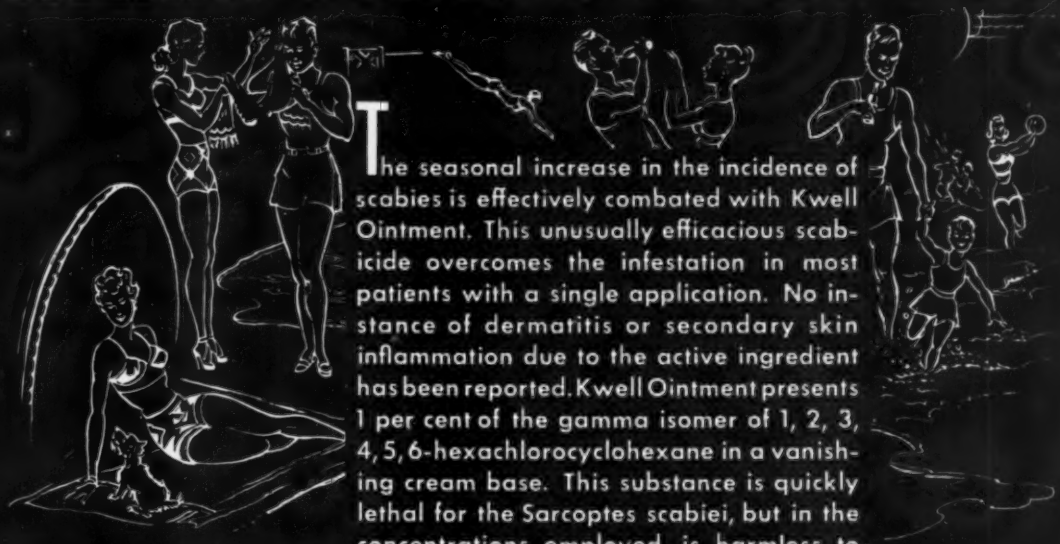

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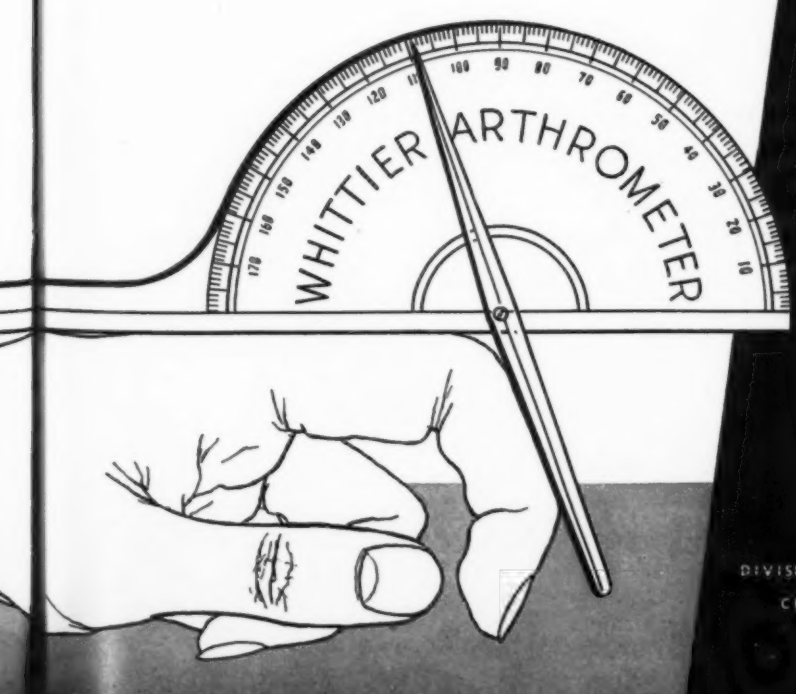

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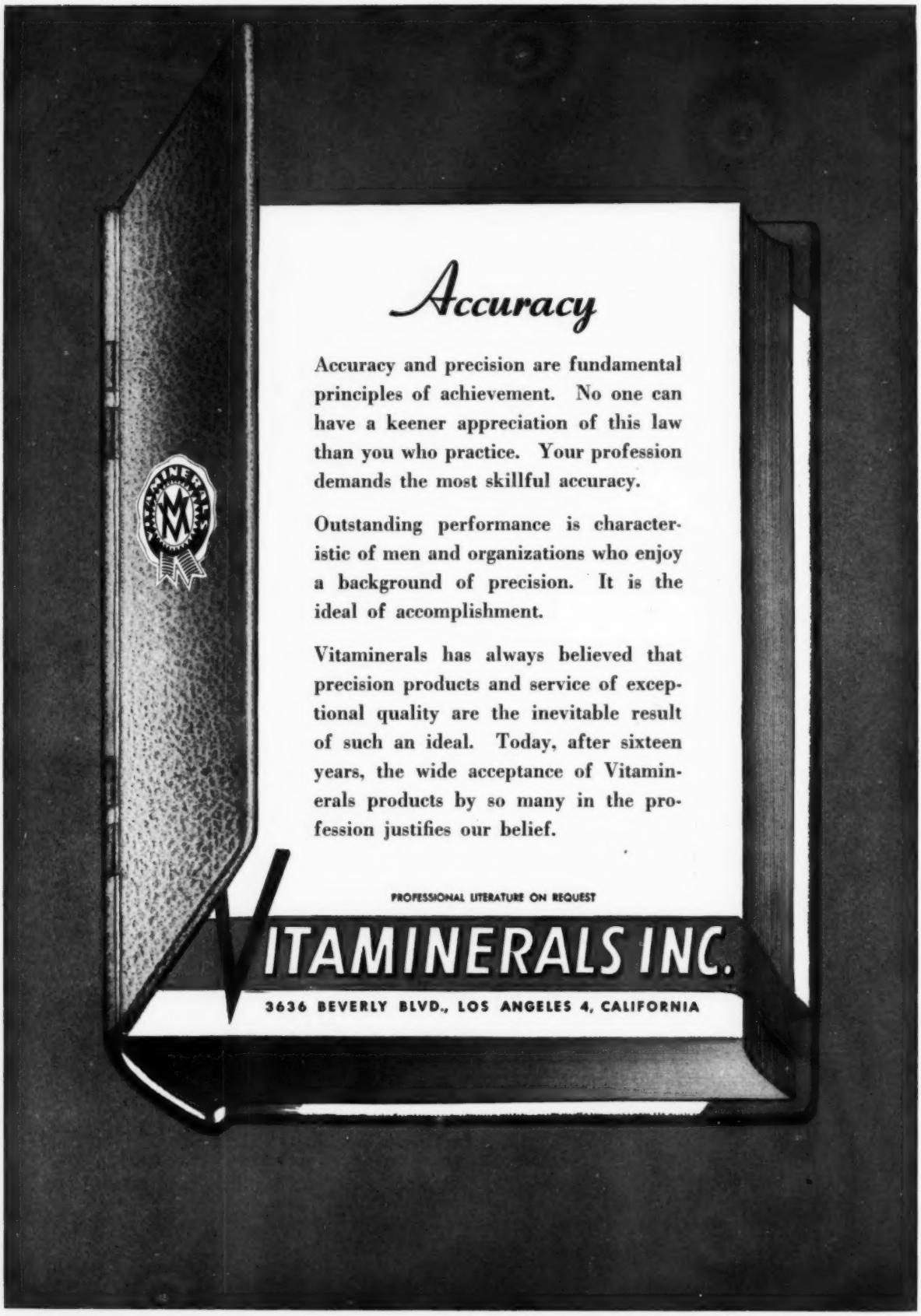
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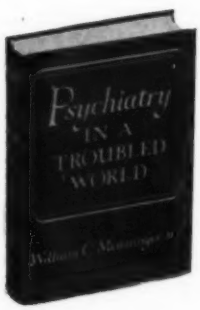
By William C. Menninger, M. D.



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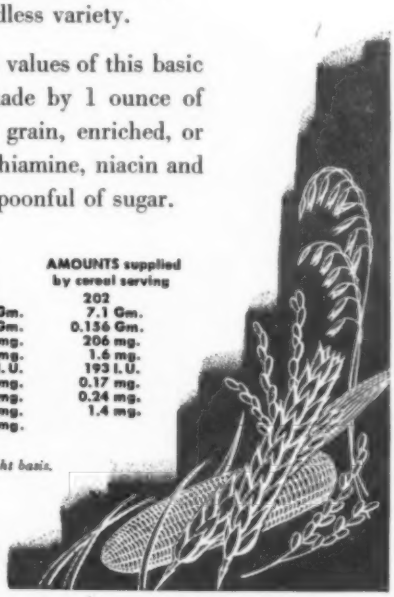

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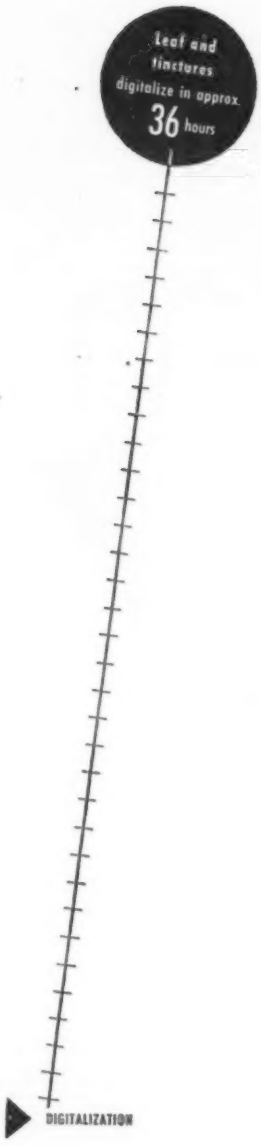

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The Journal of the American Osteopathic Association

PUBLISHED MONTHLY BY THE AMERICAN OSTEOPATHIC ASSOCIATION

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An Evaluation of Osteopathic Fundamentals*

R. C. McCAUGHAN, D.O.

Executive Secretary, American Osteopathic Association
Chicago

This is, I believe, the thirtieth annual observation of a period during the convention of the American Osteopathic Association, dedicated to the memory of Andrew Taylor Still. On July first, 1918, here in Boston, Dr. Richard Wanless[1] moved, and his motion prevailed in the general assembly of the Association, "that it is the sense of this association that at future annual meetings a short memorial service be held in memory of Dr. A. T. Still." His motion followed tribute to Dr. Still, who had passed on a few months before, by Dr. A. G. Hildreth, his associate of years and, more lately, his biographer.

A long line of outstanding exponents of the theories and practices of Still have, each year, reminded us of him, expounded and clarified his expressions of philosophy, and oriented the school of practice which he initiated with the advancing picture of biological science as it unfolds before us. More recently, the Board of Trustees has deemed it proper to select each year the member of the profession who shall be privileged to address the Association on such an occasion. I am grateful for the honor, deeply grateful, but I am also very humble. You and I remember the parade of successful physicians and able scientists who have previously addressed themselves to the same subject and who have so brilliantly expatiated on every scrap of information which is left to us of that portion of philosophy which Still called "osteopathy." My predecessors have left little to the imagination. They have pretty much exhausted the subject.

One of the pities of the profession is that so little of what Andrew T. Still believed was ever reproduced in writing. Those of us who knew him and had any personal contact with him lived long before we realized that he had not been completely recorded for the benefit of his successors. Indeed, some things he said have been incorrectly interpreted. It is easy for us to read paragraphs between the lines of his recorded words because we heard him expound and watched him illustrate his ideas and technics. It was actually, quite recently, something of a shock to me to find that some of us, searching his writings with a fine-tooth comb, were so utterly unable to locate principles and ideas which I knew had been his. It is, I am convinced, equally disturbing to learn that his mannerisms of expressions, characteristic of his time, are of such nature as to confuse the reader trained to understand only modern technical and scientific and professional vocabularies. He spoke in the medical vernacular of his time, sometimes to mixed audiences of students, physicians, and laymen. No wonder he was misunderstood or incompletely understood.

The Board has set the topic for this paper as "An Evaluation of Osteopathic Fundamentals."

I hesitate to attempt a statement of those fundamentals. Osteopathy, a school of practice in the time-accepted sense of the phrase, is a philosophy. It is biology in action. It recognizes that there are laws in biology, most of them obscure even in the light of vast research. Even with respect to the laws which we can decipher, it is difficult to estimate the proper emphasis which should be accorded them, hard to relegate them to their relative importance. We have been forced to measure those laws of biological survival by the yardstick of the degree of abuse which the body will withstand without disintegration. To a less degree we can measure the relative importance of those laws by the benefits to physiologic continuity incident in available means of aiding normal biological action—empiricism, if you will.

In trying to put into a few words a major characterization of osteopathic fundamentals, some one came up with the conclusion that it could be summed up in the two words "structural integrity," and yet a hasty perusal fails to indicate that it was a phrase coined or frequently employed by Dr. Still.

Repeatedly, incessantly, we are called upon to define osteopathy, to put it into a few words, into a dictionary. It has never been done satisfactorily—never will, I suspect. The story is too long. Dictionaries call allopathy "That system of medical practice which combats disease by the use of remedies producing effects different from those produced by the disease treated."[2] A more highly erroneous and incomplete definition would be hard to imagine. How would we fit to that sentence, the vaccines and antitoxins, treatment by hyperpyrexia, the physic in diarrheas, the escharotics, insulin, electric shock, et cetera?

Most dictionary definitions of osteopathy are equally unsatisfactory and misleading. One does not, sensibly, wrap up a school of practice of the healing art in a brief sentence. In application, osteopathy has

*Andrew Taylor Still Memorial Address. Delivered before the General Sessions, Fifty-Second Annual Convention of the American Osteopathic Association, Boston, July 21, 1948.

performed even though its theories have not been clearly explained.

It was William Harvey who said:

"Let us then blush in this so ample and so wonderful field of nature where performance still exceeds what is promised, to credit other men's traditions only, and thence come uncertain problems to spin out thorny and captious questions. Nature herself must be our advisor. The path she chalks must be our walk. For so, while we confer with our own eyes, and take our rise from meaner things to higher, we shall at length be received into her closest secrets."

A. T. Still might have said it. He thought that way. Certainly his followers have demonstrated the accuracy of it for they have found some of nature's most useful laws by questioning traditions of physicians of other schools and turning instead for information to observation of nature and her life processes.

This speaker's efforts to state the fundamentals of osteopathy may be considered mere paraphrasing of the expressions of others and as covering a small part of the whole concept of osteopathy.

The structures of the various parts of the body are so constituted that every part—every part—is directly or indirectly structurally related to every other part and the relation which, while it may be comparatively remote and minimal between some of the parts, is nevertheless in every instance of some degree of importance. The various parts supplement each other as part of the whole. The body can function without some of those parts but it cannot function normally without all of them. The functioning of the body is planned for a coordinating activity of all these parts. If the structure of these parts is normal, the resulting activities of these parts constitute functional or physiologic activity. If the structure is abnormal, the whole body is to some degree unable to act in a physiologic manner. If every part of the structure is normal, if it is anatomically in proper relationship with every other part, the coordination in functioning arising from the structural integrity will allow the body to resist to its highest ability the assaults to which environment may subject the body. That body will be in a state of health.

In using the term "parts of the body," I do not refer alone to the skeletal structure, to the muscular or vascular or nervous or respiratory or any other one of the so-called anatomical systems, nor alone to the individual organs or tissues or fluids. I refer to all of them and to every cell and to its components. I mean that any cell, if it is abnormal structurally, has an effect, however infinitesimal, upon every other cell.

Theoretically, we must not fail to remember every cell and its structure as a possible disturber of the peace. We recognize, some of us to the exclusion of almost every other fact, that certain cells, certain organs, certain anatomical systems, certain bones and, most particularly, certain articulations because of strategic location, size or function, are more important than others. We study those "parts" of the body more intensely, partly because we can evaluate their major importance and in part because we have learned methods, technics, by which we can alter their structural relationship and their influences one on the other.

Some of us would like to know how we can alter the uncooperative activities of one structurally aberrant cell which, for reasons we don't know, has got itself separated from its kind and into an area in which it cannot get the nourishment and stimulation it needs. We believe, to borrow a term from the chairman[3] of the Bureau of Professional Education and Colleges, that "perverted structure" is "microscopic as well as macroscopic." If we could physically manipulate or otherwise normalize that single cell, we might be able to stop inflammation, or degeneration, or the beginning of a malignant proliferation. At any rate, we cannot, in enunciating fundamentals of osteopathy, forget the structurally insufficient cell and its effect upon its fellows as one of the parts of the body which may be "bolshevik" to a perfect structural integrity.

We do not, of course, desire structural integrity in the body only for esthetic purposes. We want the body structurally integrated so that its various parts can produce a congruous physiology, so that the body will work to as near perfection as environment will allow, and we believe the body reaches that optimum of ability to resist the assaults of imperfect environment in a degree co-equal with the degree of structural integrity which can be maintained in the body.

In the main it is true that, in a given body, structure governs function. Even though we recognize that, to some degree at least, the functions to which the body is put may, in the long run and to some degree, alter its structure, still it is true that such function, if its results are deleterious, should be eliminated as a cause and that, when the structure of the body has suffered such functional abuse, it is sometimes possible and always useful to correct the resulting structural breakdown.

It is important, in osteopathy, that the body's ability to repair damaged structure utilizes, principally, certain activities of the circulatory system and the definite influences of the nervous system. The fluids of the body support structural metabolism. The influences generated in and transmitted through the nervous system are also essential in maintaining structural normality. Still said, in effect, that "the rule of the artery is supreme" and he might well have said, because he so clearly believed it, that guidance of the nervous system is likewise an essential. He believed the body's reparative and restorative abilities were in large measure dependent upon normal function of those two systems.

Still's ideas of immunity have been incompletely understood. He never implied that even the structurally perfect body was entirely immune to outside attack by physical force or by chemical toxins or those of bacteriologic origin. He did believe that, in just so far as we can maintain or restore structural integrity, to just that degree can we put the body at an optimum to resist assaults upon its integrity. The structurally perfect body will resist bacteriologic invasion to the limit.

Still never claimed to have discovered or initiated every technical method of maintaining or restoring structural integrity and the resultant physiologic perfection. He knew structural malformations sometimes originated in utero at a period in life when we have no means of effecting a major change in the processes of growth. He knew the physiologic necessity for rest, pain relief, reasonable cleanliness, peace of mind, and other methods of assisting the body in restoring its structure and normalizing its functions. It is not accurate to say that he believed in manipulation as the sole therapeutic modality.

But it is right to say that he initiated a new realization of the major importance of restoration of

the structure of the body and dependence upon such restoration as the most important factor in health maintenance.

And no biologist, and no experienced physician of any school of practice today will find much with which to disagree in the theories of osteopathy. Skeptical as they may be of the ability of manual manipulation to effect structural normalization, still they will all but unanimously agree to the theory that the body, structurally perfect, is very nearly immune to the pathologies which produce most ill health. . . .

It was anticipated that I would talk about an "Evaluation of Osteopathic Fundamentals."

I am particularly interested in how the values of osteopathy may be made available, how they are, and to what extent they are being made available to people, and in how that value can be extended. To the extent that osteopathically trained doctors, understanding osteopathy, apply the technics of this school of practice, our patients receive the benefits. When any one of us fails to think osteopathically, to that extent his patient suffers. There are more than 11,000 Doctors of Osteopathy in practice. That is enough to care for the health problems of many people, but it is not enough. If we could double the osteopathic population tomorrow, adding those with a real knowledge of the technical application of its theories in diagnosis and treatment, their services would be absorbed as quickly as ink in a blotter. The profession and the public should supply that need.

It is said that an altogether too large a percentage of the practicing osteopathic physicians fail to think osteopathically, to consider the patient as a whole, to hunt until they find correctable structural abnormalities or, having found them, to exhibit the necessary skill to correct them. The criticism is generally simplified crudely by saying that "they will not or cannot give a treatment."

It is loose thinking and inaccurate statement to say that, because a doctor in a given case fails to exhibit manual manipulation as a therapeutic technic, he is not "osteopathic," but it is also true that the Doctor of Osteopathy who never "gives a treatment" has failed miserably in his service to his patient.

The charge of "deserting osteopathy" is leveled with about equal frequency against general practitioners and against specialists.

The latter, in defense, say that they are occupied almost exclusively with attempts to "mop up" the failure of a body to correct its abnormal structure, that their surgery, for example, is designed to bring about a structure which will, at worst, do no further harm to the remainder of the body and at best will restore a structure which can assume all or part of its normal coordinating functions. It takes good thinking to apply philosophy through practical technics.

There is, at any rate, a very steadily increasing impression, among our best educated and most experienced physicians, that, particularly among our specialists, there is all too little application and trial of methods of structural normalization of the body's own recovery forces and all too frequent resort to dramatic surgery and wonder drugs. If just now we see in the specialties a tendency toward moderation in the application of elective surgery, a greater tendency to assist nature and to give her a chance to exhibit her own recuperative powers, a greater respect for the integrity of tissues, a little more recognition of the damage a drug can do to normal tissues at the same time it is making the body an unwelcome host for an invading bacteria, then we may hope that the specialist himself is remembering what he learned as a sophomore, and so frequently forgot as an intern, that the structurally normal body will pretty much heal itself and that the structurally imperfect body won't. We see fewer tonsillectomies today than we did 10 years ago. In my day in practice, a pain in the right lower quadrant of more than transient existence resulted in an appendectomy or a malpractice suit. Today such a pain is only a signal for a differential diagnosis. Does that mean that the much criticized specialist is relearning what his physiology taught him, that perverted structure in one part of the body can bring symptoms, yes pathologies, remote from the source, that structural abnormality brings functional disturbance sometimes remote from the source.

But I do not mean to slight the general practitioner. Is it true that often or sometimes he won't "give a treatment"? No one knows to what extent that is true, certainly not the D.O. who is dependent for his information on his occasional traveling patient. But "where there is so much smoke there is likely to be some fire" and few deny that some in our profession could scarcely live up to the alleged reputation of Caesar's wife in this regard. The excuses for such dereliction are many.

People want immediate relief; they want to sin without suffering. They are unwilling to wait for Nature's manifestations even though the doctor's training says, "Wait! Help Nature. She will repair the damage." Doctors are human and it is not surprising, but highly reprehensible, that doctors will allow what patients want and think they need to influence the treatment they receive.

Most experienced osteopathic physicians know that there are quite general manipulative methods for stimulating and assisting the body to exhibit quickly, sometimes dramatically, its curative processes. I use the word "curative" in the dictionary sense. The so-called "general treatment" is so plainly and unmistakably productive of such results that no close observer, watching its effects, can escape a conviction of its usefulness. Who among us, watching the dramatic effects of such a general treatment by a highly skilled and experienced operator in acute infectious diseases, can excuse himself for failure to utilize this therapeutic technic?

The influenza epidemics, for example, brought to each D.O. enough cases close together, much alike, as to be statistically significant. In that epidemic there was clinically important evidence of the useful effect of osteopathic manipulative technic.

We have not waited for some pathologist in his laboratory to explain in minutiae the actual physiologic processes by which the body is activated by the general treatment. The results are so uniform and so obvious to the clinician and so unusually dependable in a long series of cases that the conscientious physician cannot neglect the effort. We know that, by manipulation, we can frequently increase the supply of arterial blood to a part and that we can promote the drainage from the tissues in many areas. We know we can frequently relieve pain and bring muscular relaxation, both of which are salubrious. If early ambulation promotes recovery after surgery, there can be little doubt that manipulation of a general nature, to muscles, articulations, et cetera, should have similar effect, and experience has told us, beyond peradventure of doubt,

that this is true. And yet some of our doctors are unaware of its value and have failed to associate it with the fundamentals of osteopathy. Such blind spots are tragic.

Our technics for restoring normal body structure are all too crude. We refine them from time to time. But, successful as they have been in the past, it is scientific and professional treason to neglect what we have demonstrated to be effective.

In the study of health all biologic truth must be brought into play and we must survey all the technics which appear to have validity, discarding as rapidly as possible those which first do not fit any logical theory, and next those which, as so many do, fall into the category of doing more harm than good.

Most of us have speculated, with some reason, on the new information we will discover about the body's structure as we observe the new "tracer elements" as they pass through the body's mechanisms. If those really become applicable, may we not learn, in a given body, what structural obstructions to free flow of body fluids or nerve forces actually exist? If we do, we shall want to develop a technic to normalize that improper structure in that particular body. That will be—and why shouldn't it come to pass—a new application of osteopathic fundamentals.

Those there be that prevent the understanding of osteopathy because they fail to see that its fundamentals are basic for the application of technics of therapeutics not yet discovered. Osteopathy doesn't need fanaticism, or blind faith, or exaggeration, to bring it to complete fruition and recognition. It needs instead sober thought, based on all available scientific data and proper positioning in the field of maintenance of normal physiology.

I have never forgotten the succinct sentence from the book, "The Action of Muscles," by Sir Colin Mackenzie,[4] the Australian physiologist. I doubt if a scientist ever wrapped up more of the truth in fewer words more specifically applicable to our topic of today. He said, "If we exclude specific infectious diseases, which are in the main preventable and due to segregation, we may define health as a correlation of all the bodily systems to the erect posture, and ill health as a failure of one or more systems to correlate to it." I would have the temerity to suggest that his statement would be more nearly correct if we beheaded it to eliminate his exception of infectious diseases from his generalization.

Nor would I forget that Andry of the Faculty of Medicine of Paris, the man who is credited with originating the term "orthopedics," said that "most of the maladjustments of childhood and many of the ills later in life could be attributed to the wrong use of the body and to faulty body mechanics."

Some of you will be disgruntled because I do not emphasize, almost to the exclusion of any other discussion, the osteopathic spinal articular lesion and its demonstrated remote effects. You will have forgotten that I mentioned that some of the anatomical parts of the body which become structurally deficient are so strategically located as to become more important in their effect both locally and remotely. And some structures are, because of their location and shape, more easily damaged than others.

The articulations of the vertebrae and of their immediate appendages are located so as to be comparatively easily injured and, when damaged, to do a maximum of harm. Because that is true, we are prone to turn our attention there and to neglect the importance of damaged structure elsewhere. I chose to try to bring out those other breaks in structural integrity first, not only to round out the osteopathic concept of how the body produces health but in order to show the need for technics to restore these structural insufficiencies as well. We are not justified in neglecting, either in our thinking or in our practice, any structural defect. But the existence and the importance of the osteopathic spinal lesion and its local and remote associated and resultant pathologies are generally validated by clinical practice and laboratory research, and we accord to this spinal lesion a major importance as a causative factor in disease.

It may be argued, by some of you, that my conception of the theories of osteopathy are nothing more than partial statements of theories already propounded by scientists acceptable to old-school medicine, that at least there is nothing in the theory of the allopath fundamentally antagonistic to the theories of Still. A good deal would need to be said in such an argument. Few physicians of any school will deny the general validity of osteopathic fundamentals. But in a profession which, above all, attempts to be practical and, therefore, to bring to immediate application all available theory, we are apt to judge, and we cannot fail to judge, what one believes and accepts by what he does.

I charge that, if the rank and file of Doctors of Medicine believe that normal physiology is, in the main, dependent upon normal structural relationships within the body, they are treasonably derelict in their duty to humanity because they have failed miserably, if indeed they have made an effort worthy of the name, at the application of that theory in practical therapeutics. (And some of you will want me to interpolate at this point a comment to the effect that the osteopathic physician who denies his patient the application of that osteopathic theory is even more reprehensible.)

Be that as it may, and whatever the pronouncement of leaders in old-school medicine bearing out our osteopathic fundamental concept, and even though those evidences of awakening are observed with increasing frequency, I still cannot believe that the rank and file of old-school doctors have any important conception of the relative importance of the relationship between structure and function. If any such realization were actually widespread, why do we so often hear the nonsensical statement from physicians seeking to discourage osteopathy's ideas of spinal lesions to the effect that even hunchbacks may be functionally normal. No hunchback is normal physiologically. No hunchback is well, however efficient the body's ability to adapt itself to structural damage.

If we admit that a few doctors of old-school medicine, really a handful, realize the importance of structural integrity, yet we know that even fewer have thought enough of the importance of that idea to impel them to apply anything except gross orthopedic technics in an attempt to restore structural integrity. Almost none of them admit the major importance of the spinal articular lesion as a causative factor. How few, having given lip service to fatigue and malnutrition as producers of bad posture, have gone so far as to recognize the ultimate effects of bad posture on the respiratory exchange, the digestive processes, the circulatory interchanges, that is, on the metabolic and reparative processes altogether.

It is in osteopathy that we have seen an attempt, a more or less successful attempt, to break in on this

chain of cause and ultimate effect by the exhibition of technics, most of them in the so-called "mechanical class."

In general, in my opinion, the allopath just does not believe there is anything very important in the relationship between normal structure and physiologic performance and, even if and when he does, he has not found effective technics, nor accepted them when we have demonstrated them, to normalize those relationships.

The burden of application and demonstration of osteopathic fundamentals lies on us. For the time being at least, the research into the osteopathic concept is our responsibility. If we fail to demonstrate the efficacy of our ideas, no one else will do it in the foreseeable future.

I have great anticipations for the successful application of osteopathic principles in the restoration of health and the prevention of sickness. I believe our present day technics when compared with what we shall later learn are comparatively crude, awkward, and without the refinements and the good results which are possible with more study of the possible finesse and artistry which can be developed. I believe our successors will wonder why we are so slowly developing technics, perhaps not even manual technics, which will restore structure and, therefore, allow the body to function normally. Why can't technics, new technics, be developed to normalize the damaged structure of an organ, a tissue, a cell?

To McConnell, to Deason, to Burns, to Denslow, and to others in our profession, the laboratory technics available for measuring the local and remote effects of damaged structure have been all too scant. The factors involved are complex methods of quantitative and qualitative assay.

Of particular interest in this connection is a statement of Kurt S. Lion [5] in the Technology Review of Massachusetts Institute of Technology. He said, in part:

> For the past twenty or thirty years, chemistry has played an important role in medicine, whereas the participation of physics has been relatively limited. . . . A number of specifically acting compounds were found which could be used therapeutically. Not so in physics. The physical phenomena and forms of energy . . . are most nonspecific, at least in the ways they were used in the past. Another reason for the relatively small influence of physical sciences in medicine is simply that physics is too difficult. The physical phenomena in biology and medicine are, for the most part, so complicated that they have not been explored. The whole arsenal of physical research, from quantum theory to the technique of instruments of the highest sensitivity, is needed to investigate these problems.

And again he said, continuing:

> The newer approach involves a quantitative study of the effects of the various physical phenomena acting upon the living organisms and investigates step by step the results of these actions. Even though accurate physical measurements cannot yet be made on each and every aspect of the phenomena, the value of the approach is beyond question.

The Baruch Committee on Physical Medicine[6] makes this significant observation:

> It is evident that postural training for prevention and treatment of disease is applied in nearly all branches of medicine. We must realize, however, that postural training as a preventive agent can hardly be separated from postural training as a therapeutic agent. The attainment of a normal posture by a developing person may prevent certain ailments and deformities. The correction of posture which has become abnormal, may be *curative*. Many ailments and disabilities, including severe and crippling pain, may have abnormal posture as their causative factor—perhaps many more than is currently realized—and, therefore they may be susceptible of benefit when this functional abnormality is corrected.

This committee, in its report, refers to necessary studies of static posture and of the body in motion and "of manipulative procedures which are employed therapeutically to alter the structural mechanics of the human body."[7]

I have intentionally quoted from scientists who take opposite routes to reach essentially the same conclusion. The Baruch Committee recognizes the effect on function of comparatively gross structural abnormalities. Kurt Lion recognizes that minute structural abnormalities are likewise productive of physiologic disturbance. No thinking physician can fail to fill in the gap and reach the well-nigh absolute conclusion that every structural deviation from the normal, large or small, produces bad physiology. A few hours in a library would serve to add to these quotations many hundreds of others of similar import but we would not be far wrong if we said that, outside of osteopathy, you would have to hunt hard to find an application of that truth by the physician of today.

Alan Gregg,[8] Director of Medical Sciences Division of Rockefeller Institute, said recently a very significant thing. I quote him.

> In other centuries, doctors described disease and gave their best attention to methods of curing it. But from about 1870—the date is arbitrary—the constant quest has been for cause. Etiology became, as it were, the husband of diagnosis and the father of treatment. So unequivocal was the authority of the causative agent that an aura of daring paradox surrounded Fred Shattuck's aphorism that "sometimes it is more important to know what kind of a fellah has a germ than what kind of a germ has a fellah." Even today, preoccupation with the causation or etiology of disease all too often eclipses the light that might come from a study of the dynamics of the disease process.

And later he says:

> In our headlong and rewarding pursuit of causation, I should like to see some measure of refinement and sophistication. I would like to see causes differentiated as precipitating, predisposing or perpetuating—some such qualifying adjective is so often needed. I should like it to be a cardinal axiom of medicine that an organism is so intimate a relationship of constituent parts that you can not modify any one of them without affecting all the others; and that, therefore, a given result comes usually from not one cause but from a combination of causes, sometimes a sequence, sometimes a constellation or pattern; and similarly that a given cause has not merely one but many results, sometimes in a sequence, sometimes in a pattern.

To look again at our profession and the assessment by its members of the fundamentals of osteopathy, to which I have rather vaguely, if not indeed incoherently, alluded, let us generalize and even perhaps "opinionate" somewhat. It is a liberty not often accorded even in this country of free speech.

The osteopathic physician has an advantage over other physicians just to the degree in which he applies the osteopathic concept in his diagnosis and treatment. An osteopathic specialist is just another specialist if he fails to examine his cases without recognizing the value of correcting structure and without attempting by mechanical methods to stimulate the body's curative power. I believe it is clearly demonstrated that our most successful obstetricians, surgeons and other specialists are those who recognize the reparative value of correcting existing spinal lesions, the benefit of relaxation of excessive muscular contraction, and the improvement of circulation inherent in the carefully applied general treatment, and who see to it that such treatment is supplied to their patients. It is my opinion most successful clinicians among our general practi-

tioners are those who recognize the basic truths of the necessity for structural normality and who, having sought those abnormalities, exhibit the necessary technics to normalize them. I did not say that such doctors use only manual manipulation as a technic but I believe that is their most frequently used technic.

There is a pretty generally accepted theory in the profession that all osteopathic students should be subjected, in required educational programs, to instruction in the whole field in which they aspire to become professionals and thereafter it should be left to the discretion of each the methods which he will employ in his practice. Academically, that is considered to be justifiable. In osteopathy, our schools have attempted to provide a curriculum along those lines, and, to a greater degree than is realized by those not especially familiar with our undergraduate educational program, they have succeeded.

Recently, as criticism of the output of our schools has arisen in the profession, the Bureau of Professional Education and Colleges, the Bureau of Hospitals, the House of Delegates, and the Board of Trustees have taken cognizance of the criticism which arises chiefly, but not exclusively, from older members of the profession. A continuous study of the problem, its extent, and its solution has been undertaken. The studies and reports on the subject have been numerous but it is believed the consensus derived, although not conclusive, is about as follows:

Undergraduate instruction in osteopathic fundamentals, principles if you will, particularly in the first 2 years, is good. Teaching of technical manipulative methods is good. More hours of individual instruction are devoted to those subjects than ever before in the history of the profession. It is difficult to find and to hold good teachers in the subject but, in the main, it is being done and it is the desire and intent of the schools to do so.

There is, however, a growing belief that as the student begins his clinical studies he finds himself missing training in the practical application of theory which he has been taught—the necessity for structural integrity in the maintenance of health. It is hard to say why this should be true. Of course, his clinical teachers are under the necessity of illustrating and displaying every approved or even every fashionable therapeutic technic. The more dramatic of those technics, whether in surgery or in drugs, are easily remembered, particularly impressive. Many of his clinical teachers are specialists skilled in unusual technics not necessarily adaptable to the "mine run" of cases. Those skills impress the student. The specialist is apt to trust that the peculiarly osteopathic technics have been previously so thoroughly indoctrinated that the student will not forget to consider them as essentials of treatment in every case and therefore the specialist fails to give such methods proper emphasis during his course in clinical teaching. The result is that the student remembers what his clinical teacher actually stressed and neglects his early teaching because no good example is set for him by his clinician.

Whatever may be true of the junior and senior (because, of course, there is wide diversity of opinion among clinical teachers), the consensus is that the difficulties mentioned are grossly aggravated during internship. Here the specialist on the staff is even more dominant than is the specialist on an undergraduate faculty. The specialist is looked up to, imitated, and emulated. His impact on the mind of the intern appears to dominate. His technics, what he uses and not necessarily what he believes ought to be rendered to his patients by the general practitioner, are those inculcated into the intern's pattern. His example is generally determinative of the practice methods of the intern. That opinion is clearly borne out by the reports of the trained inspectors for the Bureau of Hospitals who have again this year studied the intern training program of every approved osteopathic hospital. They are unanimous in their findings.

Every one in the profession, including most of the leaders of the specialists, recognizes the difficulty. It is not too late to correct whatever failure to apply osteopathic fundamentals actually exists. If the profession is alive to the necessities of better education, is willing to work for the long pull, for the doctor who will graduate 5 years from now, to support our schools and to keep them constantly aware of our ideals as to their product, if we are able to support, with the help of lay friends, the research to give us new technics of manifesting the osteopathic concept, then we will continue to see a steadily wider reception of the osteopathic physician in a continually increasing part of the healing arts picture.

I cannot guarantee that the profession will awaken to its responsibilities. I believe more of our doctors are aware of the problem and of methods of solution than in times past. I know there are organized methods of solving those problems, comparatively simple solutions.

And the solution is not to go back to the good old days, which I am satisfied never existed. Osteopathic education, in osteopathic fundamentals, is better than it ever was. But it is by no means good enough. Osteopathy's fundamentals are concepts only beginning to be applied to many fields of human pathology and there is still a new day ahead.

The way is long and not easy. Results are not always either immediate or complete. God does not pay off every Saturday night. But Nature did not destroy the key to her secrets when the first physician graduated.

Poets have a way of summing up human philosophy, of orienting each of us in his proper place. As I bring these rambling remarks to an end, I remember James Russell Lowell's[9] lines, written within a few short miles of this spot, in which he said something which typified osteopathy's progress in the past and points the way for its future progress in the service of mankind.

> New times demand new measures and new men;
> The world advances, and in time outgrows
> The laws that in our father's day were best;
> And, doubtless, after us, some purer scheme
> Will be shaped out by wiser men than we,
> Made wiser by the steady growth of truth.

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Referred Pain and the Osteopathic Lesion

DELOS E. DRUCKER, B.S., D.D.S.

Department of Physiology, Kirksville College of Osteopathy and Surgery
Kirksville, Mo.

Striking similarities exist between the characteristics of the osteopathic lesion and the manifestations of referred pain. Early reporters of the latter syndrome emphasized the segmental relationship of both the pain and the cutaneous tenderness or hyperesthesia so prominent in this condition. Similarly the existence of reflex muscular rigidity associated with these other symptoms did not escape their eyes. Osteopathic physicians today use these same criteria for the diagnosis of a lesioned spinal segment, referring to tender spinous processes and spastic or "ropey" spinal extensor muscles.

Disturbed autonomic activity, which is so consistently a manifestation of the osteopathic lesion, has been reported associated with the referred pain syndrome by several workers.[1, 2] Such marked parallelism between the features of two apparently distinct clinical entities naturally brings up the question as to where the line is to be drawn that separates these two syndromes into their rightful spheres of activity. It is the purpose of this paper to review some of the literature which has accumulated on the topic commonly covered by the term referred pain and to indicate that such a line cannot be drawn at any point. Rather, increasing knowledge of the fundamental mechanism underlying the production of the various symptoms mentioned above is rapidly forcing many to the conclusion that the investigators of referred pain have at the same time been examining certain aspects of the osteopathic concept.

The overlap of these two fields is of more than academic interest. Certain implications arising out of the investigations of referred pain seem to be of importance to the osteopathic physician. At the outset it is apparent that this work has confirmed the soundness of the principles of the osteopathic concept. In addition, however, new lines of approach are suggested which may lead to a further development of the osteopathic theory, especially as regards the fundamental basis of the spinal factors involved in the production of disease in the body. Implicit in this connection is the fact that effective research along these lines may lead to the evolution of new principles of therapeutic value which the osteopathic physician may employ to further improve clinical service. The effects of such refinements may be felt not only in the correction of existing pathology but also in the vitally important field of preventive medicine.

Numerous examples of referred pain are to be found associated with the structures of the head. Included in this group is the headache arising from inflammation of the mucous membranes of certain parts of the nasal and paranasal structures,[3] or from alterations in the pressure equilibrium between the cerebral blood vessels and cerebrospinal fluid.[4, 5] Patients suffering from toothache not infrequently localize the pain in healthy teeth far removed from the carious offender. A multitude of remote symptoms may arise from the irritation set up by an impacted wisdom tooth including headache, earache, or poorly localized shooting pains following the distribution of the three divisions of the trigeminal nerve.

Other common examples of referred pain are the typical symptoms associated with angina pectoris and the shoulder-tip pain following stimulation of the central portion of the diaphragm. In the latter instance, the appearance of pain in the shoulder and base of the neck associated with tenderness and spastic muscles over the spinous processes of the third, fourth, and fifth cervical vertebrae has been related to the origin of the phrenic nerve from these spinal segments which descends to innervate the central portions of the diaphragmatic muscle. The strict segmental relation of referred pain is suggested by the observation that inflammation of the peripheral portions of the diaphragm, which receive their nerve supply from the thoracic spine, produces pain referred to the lower dorsals or the abdomen rather than the shoulder.[6]

Although the different examples of referred pain have been variously identified as somatic, somatovisceral, and viscerosomatic, there is little objective evidence to suggest that they differ with respect to mechanism of production. The intent of this paper is to show that all these examples are the result of a similar process, the various manifestations appearing regardless of whether the primary irritation is located within a viscus or on or near the body surface.

PART I

Among the first to make a study of the parts of the body surface to which the pain associated with visceral disease is referred was Head[7] who, in 1893, submitted a map of the body on which the various areas of cutaneous innervation were divided into dermatomes based on spinal levels of the cord. Later, Foerster[8] proposed a map of dermatomes based on the distribution of the posterior roots which was similar to Head's but of greater accuracy. Other men besides Head were studying the phenomenon of referred pain at the end of the last century, prominent among them being Lange and Ross. Probably best known among these pioneer investigators is Mackenzie[9] whose work represents, to some extent, a summary of the various findings and conclusions of these other men.

Confirming the observations of his contemporaries, Mackenzie noted at the operating table that the viscera could be manipulated, cut, or pinched without producing pain in the conscious patient. This led him to the erroneous conclusion that no pain fibers supplied visceral organs. On the contrary, patients suffering from pathological disturbances of visceral organs not uncommonly exhibited a unique stereotyped sensory pattern. First of all, they experienced pain which they localized on the body surface, related to the segments of the cord from which the diseased organ receives its innervation. Secondly, in addition to this frank pain, certain areas of skin exhibited a marked tenderness to light touch and friction, although no disorder could be found in these areas of hyperesthesia. Like the actual

pain, this superficial tenderness followed closely a segmental relationship to the level of pathology. Thus, cardiac disease was characterized by tenderness of the vertebral spines of the upper thoracic vertebrae as well as of those portions of the arm which received their innervation from the same segments. In contradistinction, disturbances of the abdominal contents, pancreas, or kidney, produced tender spines in the lower dorsals. So consistent were these findings that they were useful clinically in reaching a final diagnosis upon a patient.

Finally, Mackenzie[9] noted the production of rigid muscles in association with these visceral disturbances which again followed the segmental relationship exhibited by the sensory manifestations. Thus a patient with cardiac disease showed increased tension of the spinal extensor mass associated with the upper thoracic portion of the spine and might exhibit muscle spasm in the affected arm as well as constriction of the muscles of the chest wall.

Correlating these observations in the light of contemporary knowledge of the physiology of the central nervous system, Mackenzie attempted an explanation by means of his theory of the "irritable focus." He suggested that stimulation of viscera gave rise to nonpainful impulses in the visceral afferent nerves which entered the posterior root of the spinal segment associated with the viscus. Having entered the cord, these stimuli produced a localized area of irritation or commotion which spread to other portions of the gray matter of that segment. As a result of this irritation, sensory afferent impulses from the skin of the same segment which would normally be subthreshold, were reinforced to the extent that they would impinge upon consciousness. The resultant sensation experienced by the patient would be localized as pain on the body surface.

Aware that referred pain is regularly accompanied by tenderness of the skin in association with the areas of pain and that this tenderness not uncommonly remained after the disappearance of the pain, Mackenzie sought an explanation on the basis of his original thesis. He suggested that once established, the "irritable focus" remained for a variable period of time even after the initial cause of this irritation had been removed. As a result, light contacts with the skin continued to be augmented in the irritated segment to the extent that hyperesthesia resulted.

In a like manner he explained the production of muscle spasm. As the effect of the disturbance in the spinal cord spread to the anterior horn, the motor neurons were activated resulting in contraction of those muscles which received innervation via that spinal level. It is in this connection that the inappropriate term "viscerosomatic reflex" arose.

Response to Mackenzie's concept has been varied. We now know that, contrary to his original belief, the viscera are supplied with nerve fibers capable of setting up a pain response in the organism. Hinsey and Phillips[10] have examined the "irritable focus" theory in the light of increased knowledge of nervous physiology and have restated it in terms of facilitation. Given a condition which leads to the transmission of impulses to a segment of the cord, the increased advent of stimulation to the neuron pools will enlarge the subliminal fringe* and thus bring the cells closer to threshold through the process of facilitation. In such a condition of increased excitability, a relatively few more impulses arriving at that particular segment from whatever source, may supply the small amount of additional stimulation which is required to bring the neurons to threshold and cause them to fire. In support of this concept is the recent work of Denslow and others[11] which demonstrated that in a spinal segment in a state of hyperresponsiveness (i.e., lesioned), "spontaneous" efferent activity from that segment may be initiated by impulses brought to it from a variety of sources including higher (cortical) centers, proprioceptors, tactile receptors, etc.

Recently, suggestive evidence appearing to support Mackenzie's concept of the lingering of the area of "irritation" beyond the duration of the initial source of stimulation has been presented by a Russian worker, Frankstein.[12] He injected turpentine into the paw of a cat, noting the characteristic signs of inflammation such as limping, withdrawal of the paw, and the like. After some time, the irritation disappeared and no signs or symptoms remained of the former lesion. At this time, he decerebrated the animal by section through the brain stem caudal to the superior colliculi. The animal now showed once more the same evidence of irritation that had been present when the lesion was acute, namely, flexion of the affected leg and crossed-extension, the characteristic spinal reflex response to pain. He concluded that the initial irritation had set up some altered state within the central nervous system which had persisted for a considerable period of time. It is postulated that the altered state of the cord remains for some time after the precipitating lesion has subsided, but is masked by action of the higher centers. When this cortical effect is removed by surgical section, the altered nervous state is released to exert its influence. Here is evidence that a peripheral lesion may set up an alteration within the central nervous system which may persist for a considerable period of time after the original irritation has disappeared although in its natural context in the body it may not produce gross effects. The possibility still remains that an abnormal shift in afferent stimulation to the particular segment of the cord involved may produce untoward effects upon related structures as a result of the influence of the altered nervous state.

It is interesting to note that although within recent years there has been a tendency to regard Mackenzie's irritable focus theory as a naive description of increased facilitation of spinal neurons, a school of thought is developing which seems to support the literal meaning of Mackenzie's original concept. This is the Russian group headed by Speransky of whom Frankstein is a member. In his thought provoking book, Speransky[13] presents evidence that disease processes in the body bring about permanent alterations within the substance of the spinal column which henceforth influence not only the pathological condition in progress but also all future activity. He states that following certain irritations of peripheral nerves, trophic changes take place which can be demonstrated microscopically within the substance of the gray matter. This suggests an "irritable focus" which is irreversible in nature and which must be permanently reflected in any future nervous activity involving the affected area. Although this work has not been entirely confirmed, it does suggest an interesting basis for the existence of lesions of virtually unvarying severity over periods of a year or more which were demonstrated by objective methods in

*"Subliminal fringe" is a physiological term describing the state of partial excitation, or facilitation of a group of cells in a neuron pool. Cells in such a state are close to threshold and a small amount of additional facilitation will bring them to threshold. Such neuron pools, then, are hyperresponsive to stimulation arriving from any source.

the work of Denslow and his colleagues.[11,14] A more detailed discussion of Speransky's work in relation to the osteopathic lesion will be presented in another paper in this series.

PART II

The work of Lewis and Kellgren is of particular interest in that it has not only advanced the knowledge of the reflex muscular aspects of the referred pain syndrome but also, by focusing attention on the mechanism of production, has done much to relate the osteopathic lesion to this condition. Lewis apparently became interested in the subject of pain in the late twenties or early thirties of this century. Inevitably led to the study of referred phenomena, his first paper on visceral aspects of this subject appeared with Kellgren in 1939.[15] Both he and Kellgren had made observations on referred pain of purely somatic origin and effect and using the methods of these early studies,[16] a series of experiments was carried out to determine what "somatovisceral" reflexes were demonstrable.

In order to set up an irritating source, 0.1 to 0.3 cc. of 6 per cent saline was injected into the interspinous ligaments of a number of human subjects. This procedure results in pain which develops within a minute or so, rapidly increases in intensity within another few moments to become quite severe and subsides in the next 3 to 5 minutes. Several examples may be cited as being typical and of interest. The eighth cervical segment was injected in normal subjects and it was noted that pain was felt in the upper interscapular region, over the pectoralis major muscle and radiating down the inner aspect of the arm. A similar injection was performed on a patient who had long exhibited typical attacks of angina of effort. The resultant pain was identical with that of an anginal attack and not to be distinguished from the latter in any way save for the local pain at the site of injection. Such results were readily reproducible and were obtained from a number of patients by these authors.

Injection of saline into the ligament of the first lumbar segment resulted in a referred pain which simulated the pain of renal colic, namely, pain in the loin, inguinal, and scrotal regions, and retraction of the testicle. In conjunction with this example as with most of the others is the appearance of unilateral rigidity of the abdominal muscles and skin tenderness. On the basis of indistinguishability of the natural from the experimentally induced attacks, it is concluded that both these phenomena are expressions of similar basic mechanisms.

Attention was now turned to a study of the reflex muscular contraction noted in the above experiments. This study was of interest for at least two reasons. First, it permitted the use of experimental animals and in addition, permitted the use of objective methods of observation and analysis. In this work, a decapitated cat was employed and myographic tracings made of the abdominal oblique muscles in response to both saline injection of the twelfth dorsal vertebra and direct stimulation of abdominal contents. In this way, it was demonstrated that responses in the cat were analagous to those obtained by saline injections in man and it was assumed that findings from direct abdominal stimulation would likewise apply to man. Throughout this series of observations virtually identical results were obtained from stimulating visceral structures as were observed following injection of the interspinous ligament of the appropriate spinal segment. Hence, the obvious conclusion is reached that a typical pattern of referred pain and muscular rigidity may be produced by either stimulating the particular viscus involved directly or by irritating somatic structures lying in the same segmental layer.

This appears to be a fundamental conclusion. Here is objective evidence to reveal the intimate relationship existing between the visceral organs on the one hand and the segmentally related somatic structures on the other. If virtually identical effects are reproducible by stimulation of two remote areas, there arises the natural question: What is common to these remote areas which may account for the similarity of effect?

In all of these experiments, the one structure in common was a particular segment of the spinal cord. Given a source of irritation, of afferent impulses, anywhere within the area of a given spinal segment, the spinal cord acted as a distributing center organizing reflex responses in other segmentally related structures. In this process, no evidence exists to assign the spinal segment the initiating role. On the contrary, in every instance the primary source of irritation has been outside the cord. The particular spinal level affected has been activated purely on the basis that it was the recipient of afferent impulses via its dorsal root. The neuron pool must "make do" with what is given it; in each case, the ingredients consist of afferent impulses. Once this supply of afferent volleys is reduced, facilitation regresses, the subliminal fringe gradually decreases and efferent volleys stop. As has been pointed out earlier in connection with Frankstein's work, this return to the normal level of activity apparently is not immediate but requires the lapse of a certain period of time before all the local excess neural activity has subsided.

This concept compares favorably with the conclusions recently published by Korr.[17] Reviewing the available information on the physiology of the osteopathic lesion, he finds that an osteopathic lesion is characterized by a segment of the cord maintained in a chronic state of hyperexcitability. Such segments have been shown to have a markedly lowered motor reflex threshold so that relatively minor stimuli cause the anterior horn cells to fire in contrast to the normal segment whose threshold may not be reached by stimuli of even traumatizing intensity. Presumably because of the chronically enlarged subliminal fringes in these segments, they are hyperresponsive to all impulses which reach them—from the skin, muscles, higher centers, and even from normal, high threshold segments. He concludes from this: "The lesion, therefore, is to be conceived, not as a radiating center of irritation, spreading excitation to other segments, but rather as a segment upon which irritation is focused."

The work of Lewis and Kellgren on referred pain and that of Denslow on the osteopathic lesion have demonstrated that this distribution of effect is to somatic structures, via the anterior horn cells. The question now arises as to whether this facilitation is confined to the ventral horn exclusively. Knowing the intimate relationship which exists between all the neurons within the cord, it may be anticipated that within a segment, none is immune to the facilitating influence. Current work in this laboratory by Korr and Goldstein,[18] recently reported before the American Physiological Society, is directed at investigating the degree of facilitation of the intermediolateral column as reflected in the skin. The evidence thus far indicates

that within a lesioned segment there is hyperactivity of the sympathetic nervous system. They have shown that within the dermatome associated with a facilitated level of the cord there is increased activity of sweat glands as determined by skin conductivity measurements. It is anticipated that further study will indicate that this relation between facilitation of the anterior horn neuron pools and the intermediolateral column will extend to include all activity regulated by the autonomic nervous system. In this latter connection, work on kidney function in the dog is being carried out by Dr. Korr and the writer to determine what effects segmental somatic irritations may have on visceral function via the autonomic nerves. The methods are such that it will be possible to determine not only the immediate effects of such irritation in such functions as renal blood flow, glomerular filtration rate, and tubular activity, but also the more enduring effects brought about by chronic irritation.

PART III

We have left until last consideration of the component of this reflex phenomenon what logically might well have been examined first, namely, the basis for the referred localization of the pain. However, its consideration has been postponed advisedly. Actually we are dealing here with a complex syndrome characterized by three outstanding features: (1) Reflex muscular contraction, (2) reflex cutaneous hyperesthesia, and (3) referred pain. It may well be that originally the dramatic feature of the false localization of pain obscured the equally fundamental and clinically important aspects of this syndrome, namely, the tenderness and muscular contraction. Lewis and Kellgren[18] were among the first to give these phases their proper attention. Hence, it has seemed desirable to focus attention on these other manifestations at the outset.

Several explanations have been offered to account for the experience of pain as arising from somatic areas rather than from the sick viscus itself. Most of these are based on the fundamental conclusion that cutaneous body areas are well represented in the cortex in contrast to visceral areas. As a result, stimulation of ascending pain tracts in the cord leads to the activation of the cortical areas which usually are affected by cutaneous injury. Hence, on the basis of past experience, the cortex falsely locates the pain as arising from such somatic sources.[19]

The convergence theory[20] for referred pain is based on the fact that there are many more afferent pain fibers to the cord than there are fibers in the spinothalamic tract. Therefore, it is postulated that several pain fibers must synapse on the same neuron of the ascending bundle; sensory fibers from both the skin and viscera may terminate on the same cell. In such a case, the impulses reaching the cortex from an internal organ would be quite indistinguishable from those arising from somatic sources. On the basis of previous experience, such pain would tend to be projected to the body surface.

A recently published paper[21] suggests an entirely new basis for the production of referred pain. Observations on patients with occlusive heart disease revealed the presence of ischemia in the peripheral nerves arising from those spinal segments which likewise innervate the heart. These same findings were demonstrable in experimentally induced states. It was found that the ischemia was brought about as a result of vasoconstriction of the vasa nervorum of the involved nerves.

From these findings it appears that visceral pathology may send impulses to the spinal cord which produces facilitation of the intermediolateral column and thereby increases sympathetic stimulation of the vasa nervorum. The resulting vasoconstriction produces ischemia of related peripheral nerves. As a result the nerves send impulses to the central nervous system producing a painful sensation.

PART IV

In reviewing the present status of the problem, we see a rather interesting situation. At the time that A. T. Still was formulating his concept of osteopathy, Mackenzie apparently was observing many of the same phenomena in his patients. Where Still saw in the implications of his observations the basis of an entirely new rationale of therapy, Mackenzie sought to introduce his hypothesis into established medical tradition. That the response to the ideas of both these men was similar is evidenced by the statement of Mackenzie:[22] "In putting forward the view that the pains arising from the viscera are not felt in the organ, but are referred to the peripheral distribution of the cerebrospinal nerves in the external body wall, I have opposed to me the practically unanimous opinion of all people, whether they have studied the subject or not."

The different approaches of these two men to what now appears as a problem in common gave rise at the close of the last century to what, at that time, seemed to be two independent schools of thought based on similar clinical findings. Further, basic research on the part of proponents of both schools has independently elaborated the manifestations of the original findings. In reviewing these findings, a singular parallelism appears. Thus, the fundamental tenets of the osteopathic concept include reflex muscular rigidity, related segmentally to areas of pathology, cutaneous tenderness and alterations in tissue texture, likewise on a segmental basis, which implies altered autonomic function. The same manifestations are seen in the referred pain syndrome. In both entities, the spinal cord is seen to play a dominant role in the production of these signs and symptoms and it may well be that the manner in which the central nervous system brings about the organization of these responses is on a similar basis.

In reality, there need be no surprise at this turn of events. If these two men made accurate observations initially, it is to be anticipated that investigation of their hypotheses must inevitably lead to the fundamental mechanism involved. If they were initially observing the same thing, then it is obvious that regardless of the devious path which intervening opinion may have taken, when the ultimate basis for these findings is determined, it must be the same in both cases.

In the main, at least, it appears that research is arriving at the basic mechanisms underlying the manifestations of these concepts. The increased application by nonosteopathic doctors of therapeutic procedures based on the implications of the referred pain concept has led to many innovations in their clinics. Unlike the osteopathic profession which has been employing this concept effectively, albeit empirically, for many years, the nonosteopathic school is just beginning to feel its way. Nevertheless it has turned up clinical technics which might well be adapted or modified by osteo-

pathic physicians in the light of their superior experience.

PART V

One of the first studies of the referred pain syndrome suggesting therapeutic application was that of Weiss and Davis.[23] These men sought to determine at the clinical level the validity of the hypothesis delineated by Mackenzie that referred pain manifestations arose as a result of the simultaneous arrival at a segment of the cord afferent bombardment from both a visceral and a somatic area. They reasoned that if such were the case, then the referred pain might be relieved by eliminating one source of these afferent impulses. They selected a group of patients suffering from a variety of visceral pathologies, all of whom exhibited clearly circumscribed areas of referred pain. They then injected 2 per cent novocaine just under the skin of the areas of referred pain and observed the effect on the sensation of pain as experienced by the patients.

Among the disease conditions represented by their patients were angina pectoris, pleurisy, carcinoma of the esophagus, ulcer, appendicitis, etc. In all cases, save one of tuberculous pleuritis, marked relief followed injection almost immediately. In most instances, there was complete relief from all pain; several subjects, however, suffering from pleuritis of pneumonia, still experienced a dull, deeply located pain, on deep breathing or coughing. The authors suggested that this was due to the involvement of larger areas of inflamed tissue during the greater lung expansion thereby involving skin areas not anesthetized. This finding might also be interpreted as representing true visceral pain, the so-called protopathic pain of Head, in contrast to referred somatic pain. It was concluded that this study substantiated the concept that referred pain resulted from afferent bombardment of a spinal segment from a diseased viscus creating a state of facilitation which reinforced stimulation from cutaneous areas to reach threshold and consciousness. The authors have not taken into consideration the reflex rigidity which was observed at the same time and which no doubt played a part in the increased advent of afferent bombardment from the particular area of skin reference.

Of particular interest was the duration of relief following the use of novocaine. Assuming that in severe pain, the effects of the anesthetic may be expected to last no longer than 3 hours, it would be anticipated that within this period of time, the original pain would have returned. This was not found invariably to be the case. It was noted that the time of return of pain varied from 30 minutes to as long as 6 hours, the latter time certainly appearing to be beyond the normal activity of 2 per cent novocaine. Furthermore, there was no relation between the amount of novocaine injected and the length of time the anesthetic produced relief. Thus, the pain of one pneumonia patient receiving 20 cc. of procaine had a return of pain in 30 minutes; another patient with pneumonic pleuritis, received only 8 cc. and had relief for 6 hours. Even smaller injections (2 to 4 cc.) gave relief for periods of hours. Whether the intensity of the pain upon return after prolonged periods of relief was as severe as before injection was not indicated.

This prolonged effect is suggestive that the use of anesthetic has been of some therapeutic value. While it is not yet possible to offer conclusive data to explain this beneficial effect, there is enough presumptive evidence to offer a possible basis. As stated earlier in this paper, the effects of facilitation in a particular segment of the cord include the cells of the autonomic nervous system. Thus, we may anticipate that in many cases, the diseased organ is subjected to altered nervous stimulation via its autonomic nerves as a result of this central imbalance. It is suggested that in many instances, this abnormal activity serves to prevent or retard the normal reparative processes of the body.

In support of this concept is the fundamental precept of the osteopathic philosophy that the body has the power to heal itself. Thus, the rationale for therapy is not to cure disease but rather to enable the body to bring about repair. Such a concept is the basis of the vicious circle hypothesis which suggests that the irritated organ tends to aggravate its own condition by altering the activity of the spinal cord supplying it. Accepting such a theory, it follows that the novocaine treatment, by altering in some way the activity of the spinal cord, serves to shield the diseased viscus from excessive autonomic stimulation for a period of time during which natural repair can take place.

That such treatment is not an adequate therapy is evidenced in certain of the cases of Weiss and Davis, such as acute cholecystitis. The patient, in addition to suffering reflex pain, muscular rigidity, and hyperesthesia in the right upper quadrant, had occasional vomiting attacks. Following administration of the novocaine, the pain (and presumably the associated reflex manifestations) disappeared but her vomiting continued without noticeable abatement. Thus, the action of the local anesthetic can not be considered to affect directly the primary irritation. Since vomiting is a reflex associated with afferent impulses passing up the cord and exciting the vagus nerve, it is evident that the viscus was still maintaining sufficient afferent stimulation to the cord to effect vomiting. Without the facilitation from the skin, however, such impulses were not of sufficient strength to reach the consciousness of the patient, as pain.

Subsequent investigators have not completely endorsed this work of Weiss and Davis. Hinsey and Phillips[10] report a case of Livingston's in which pain referred to the shoulder from irritation of the dome of the diaphragm could not be prevented by infiltrating the shoulder area. Others have similarly reported failure to relieve pain by the use of novocaine in the areas of pain reference. No one has explained adequately why this therapy is effective in some cases but not in others. It has been suggested[24] that relief is obtained in those conditions where the pain is primarily referred in character with little or no true visceral (protopathic) pain present.

PART VI

Confirmatory evidence of the work of Weiss and Davis[23] recently appeared in one of the British journals. The author, G. W. Theobald,[25] has recorded a number of observations which are of interest not only because they lend themselves to the Mackenzie hypothesis of referred pain, but also because they demonstrate how M.D.'s are adopting this concept clinically.

As the author points out in his introduction, the gynecologist occupies a particularly strategic position

for the study of referred pain. One of the most common clinical disorders with which the gynecologist must deal is that of dysmenorrhea, which represents an excellent example of referred pain. Furthermore, since labor pains are an intensified expression of dysmenorrhea, efforts to control the pains of childbirth may be considered a further clinical study of referred pain. Any procedure which is clinically effective in relieving a form of referred pain must act by interfering with, or altering, the normal course of events which brought about that pain. Analysis of such technics, therefore, not only confirms our hypothesis, but also may furnish the basis for improved clinical service.

The distribution of pain associated with dysmenorrhea is most commonly to the lower parts of the abdomen or back. Less frequently, it is experienced as radiating down the medial aspects of the thighs. This area of distribution represents the area of the body, innervated by the upper lumbar segments of the cord. Two large nerves arise from the first lumbar segment and distribute their branches within the dermatome: (1) The iliohypogastric which supplies the internal and external abdominal oblique muscles and the skin just above the symphysis pubis and, (2) the ilioinguinal nerve which innervates the internal oblique muscle and the skin of the inner portions of the thighs. The innervation of the uterus is derived from the last two thoracic and first lumbar segments.

Anatomically, then, there is ample evidence to relate the uterus to the site of referred pain on a segmental basis and with this background, the course of events in the production of pain from the uterus may be postulated. Contraction of the uterine muscle sends volleys of impulses to the first lumbar segment of the cord. As a result, facilitation of virtually all neurons within this spinal segment takes place bringing to threshold the various efferent cell bodies present. This produces spasticity of abdominal muscles, reflex hyperesthesia, and pain in those areas served by the iliohypogastric and ilioinguinal nerves. In addition, there is altered autonomic activity affecting both the skin and the uterus itself.

The role of the cerebral cortex in the production of facilitated segments has been mentioned previously but its contribution in the pathogenesis of dysmenorrhea is so striking as to warrant special mention. One of the major functions of the cortex is the constant transmission of impulses to the spinal column. As a result, there is facilitation of neurons to a greater or lesser extent throughout the entire cord. This has the effect of establishing and maintaining a certain basal level of nervous activity within the nervous system during the waking hours. Therefore, at no time do afferent impulses entering the spinal cord find it completely devoid of neural activity.

Psychological factors have been mentioned as playing an important role in the etiology of dysmenorrhea. Patients who ordinarily suffer mild pain during menstruation may experience severe, incapacitating symptoms when the menstrual periods occur during a time of worry, mental distress, or apprehension. In such patients, we may consider that the increased cortical activity has increased the flow of impulses to the spinal cord producing a more intense background of excitation throughout the column. The same amount of afferent bombardment reaches the first lumbar segment from the uterus as on previous occasions but the impulses are now superimposed upon a high background of spinal cord excitability and, therefore, the overall effect is magnified, producing greater muscular rigidity, pain, and hyperesthesia in that segment.

If our hypothesis of referred pain is sound, it is to be anticipated that the various symptoms associated with this condition may be relieved by blocking out one or more of the sources of afferent bombardment to the segment in question. Such is the case. Theobald[25] states that psychotherapy is frequently of considerable value in the prevention or alleviation of dysmenorrhea. Such therapy may be considered to interrupt the facilitating stream from the higher centers so that the degree of excitation of the segment is reduced.

It appears that here we are illustrating another of the fundamental principles of osteopathy in terms of modern physiology, namely, that the body must be treated as a whole. The relatively recent development of the science of psychosomatic medicine clearly indicates the growing awareness of the importance of the higher centers of the nervous system in the treatment of disease. As Korr[17] has pointed out, it may well be that the production of peptic ulcer, for example, in a tense individual is related to the arrival of abnormally large numbers of impulses from an active cortex at an already facilitated (lesioned) segment of the cord which segment serves to channelize out the stimulation to related structures. In such a case, treatment may be aimed at either the source of the nervous stimulation or directly at the facilitated segment; presumably the optimal benefit would follow if both were treated. Failing to correct the spinal lesion, even though the neurosis be removed, leaves a segment of the cord which is vulnerable to nervous stimulation from other sources.

Theobald states that dysmenorrhea may also be relieved by the injection of local anesthetic subcutaneously on either side of the anterior superior iliac crests or into the area of skin in which the referred pain is being experienced. Such a procedure has generally been found to produce rapid and complete relief from the pain. The rationale of such injection therapy seems clear. In either case, the effect is to interrupt the flow of afferent impulses from skin and muscles to the cord and thus prevent facilitation. This may be done directly by inactivating the receptors in the skin or muscle, or by blocking the nerve (iliohypogastric or ilioinguinal) as it passes around the ilium in its course to the first lumbar vertebra.

If labor pains are produced in the same manner as is the pain of dysmenorrhea, then we may anticipate that those procedures which relieve dysmenorrhea will likewise relieve childbirth pain. In this connection, Theobald states that he has been able to carry several patients through labor without pain merely by injecting subcutaneously the iliohypogastric and ilioinguinal nerves at the ilium and the pudendal nerves. In this case the additional anesthetic is conceivably necessary to eliminate pain referred via the lower spinal segments related to the cervix and vagina. Confirmation of such a procedure is seen in the use of continous caudal anesthesia during labor. In this connection, it has been demonstrated[26] that when the anesthesia reaches the level of the cord to interrupt the iliohypogastric and ilioinguinal nerves, all pain associated with contraction of the uterus is relieved.

PART VII

The papers reviewed here have been selected arbitrarily from a great number of similar reports. They are not a measure of the amount of work which is

being done in this field, but represent, to a limited extent, a survey of the present status of the referred pain concept. From the standpoint of symptomatology, the similarities between referred pain and the osteopathic lesion are apparent. Referred pain is associated with segmentally related muscular rigidity, cutaneous hyperesthesia, and altered autonomic function. If the words "osteopathic lesion" be substituted for "referred pain" above, the statement is equally true. Present knowledge of the etiology of these conditions is likewise strikingly similar.

Although no studies have been made comparing the relative merits of manipulation as against local anesthetization, the existing evidence indicates that with one or two exceptions, novocaine technics are effective for only relatively short periods rather than productive of a curative effect. (The notable exception is in connection with the treatment of trigger spots. This subject will be discussed in a later paper.) Their value then to the osteopathic physician is not as new therapeutic tools. Rather they provide an insight into the nature of the lesion and, more important, may offer information as to the manner in which manipulation is effective as a therapeutic agent.

The use of manipulation by the osteopathic physician is based on the concept that joints and their supporting structures are subject to derangement and that such derangement provides a potent source of irritation to the spinal cord and thereby to related structures. The correction of such pathology by returning the parts to a functional normal is aimed at providing a permanent curtailment of stimulation to the cord. It is to be expected that novocaine block of the afferent nerves from such a lesioned area would likewise be effective in preventing irritation of the central nervous system. However, such treatment can be considered only as palliative since the original tissue insult is still left unaffected. It may be suggested that the use of local anesthetics is effective in those conditions where soft tissue manipulation alone is beneficial. This, however, begs the question as to what changes in structure, metabolism, and circulation are produced by such treatment.

These questions are of more than theoretical interest. Osteopathy has passed from the vision of one man to an internationally recognized therapy in little more than 50 years. The profession may justly pride itself in such phenomenal growth but it must be aware of the responsibility which it assumes by virtue of its powerful position in the healing arts. Never again can a single physician sit back complacently in the belief that his therapeutic armamentarium is completely adequate. The sciences of physiology and pathology are advancing too rapidly to allow us to pause. Effective as present osteopathic therapies may be, they can be improved and made to include more branches of medicine. Improvement can only be accomplished by finding out first just what manipulation does. Then intelligent modifications can be made to suit particular circumstances for a superior clinical result. Medical research has suggested new avenues of approach to these problems but the final work can only be accomplished by the osteopathic profession itself.

Kirksville College of Osteopathy and Surgery

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NORMAL FLEXIBILITY ACCORDING TO AGE GROUPS

Accurate data regarding the normal flexibility of the human spine at various age levels are of extreme importance. Such data should constitute a guide in determining whether individual inability to accomplish certain movements is normal or abnormal.

With the overemphasis on obtaining flexibility in much present-day treatment of poliomyelitic patients, we see increasing need for a guide to what is "normal." . . .

In patients affected by poliomyelitis and other diseases which produce muscle weakness, stability rather than flexibility is of paramount importance in the end result. Such stability is essential in the spine, as well as in the extremities. In the presence of muscle weakness, one should be unusually cautious to avoid stretch of the underlying structures, so that ligamentous and capsular support may help to compensate for loss of muscle support. George E. Bennett, M.D., *Journal of Bone and Joint Surgery*, July, 1948.

DR. STEPHEN M. PUGH
Everett, Washington
President 1948-49

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SUMMARY OF BOSTON MEETING

As this JOURNAL goes to press, just a few days following the close of the fifty-second annual meeting of the American Osteopathic Association in Boston, there is insufficient time to give more than a bare summary of the many activities which took place at this historic site. For a full account and pictorial review of the meeting the reader is referred to the September FORUM. The edited minutes of the meetings of the House of Delegates and the annual reports of officers, department, bureau and committee chairmen of the Association will be published in the September JOURNAL.

The registered attendance at the Boston meeting was as follows: Doctors of Osteopathy 1,024, students 17, guests 335, exhibitors 367, making a grand total of 1,743.

France was represented by Dr. William J. Douglas of Paris, third vice president of the A.O.A. in 1936-37. From Hawaii came the official delegate, Dr. Isabelle Morelock, her sister, Dr. Josephine Morelock, and Dr. Frank Gladding. England was represented by Dr. Carl Cook. Many physicians from Canada were present.

Preconvention meetings of the American Association of Osteopathic Colleges, American College of Osteopathic Obstetricians, American Osteopathic Society for Study and Control of Rheumatic Disease, Osteopathic Cranial Association, Society of Divisional Secretaries, and the Board of Trustees and House of Delegates of the A.O.A. drew a large number of doctors who registered early to avoid the Monday morning rush.

The meeting was called to order the morning of July 19 by President Robert B. Thomas of Huntington, W. Va., in Paul Revere Hall, Mechanics Building. Following the singing of the National Anthem by the entire assembly and the invocation by the Rev. Gardiner Shattuck of Trinity Episcopal Church, Boston, Program Chairman Dr. George W. Northup, Livingston, N. J., read a message from the President of the United States. (Published in the July JOURNAL.) Addresses of welcome followed by Dr. Raymond W. Boyd, Lynn, Mass., president of the Massachusetts Osteopathic Association; the Hon. Arthur W. Coolidge, Lieutenant Governor of the State of Massachusetts; and Mr. Daniel F. Donovan, Boston, representing the Mayor of the City.

President Thomas sounded the convention keynote—"The General Practitioner—The Stability of the Osteopathic Profession"—in his splendid address following the welcoming speeches. Mrs. G. N. Gillum, Kansas City, Mo., president of the Auxiliary to the American Osteopathic Association, brought the greetings of the wives of osteopathic physicians and reviewed the work of the Auxiliary. Dr. Lydia T. Jordan, Davenport, Iowa, president of the Osteopathic Women's National Association, told of the many activities of the professional women in osteopathy.

The morning's session ended with a brilliant address by Irvin M. Korr, Ph.D., Kirksville, Mo., on "The Emerging Concept of the Osteopathic Lesion."

As the excellent scientific program unfolded during the afternoon of the first day and for 4 days thereafter, the careful 2 years' planning of Program Chairman Dr. Northup for this meeting was evident. The procession of good papers in both the general and teaching sessions brought many favorable comments from the doctors in attendance. Many of these papers will be published in the official JOURNAL during the next few months.

A new motion picture on osteopathic research was shown for the first time. This film, in color and sound, is on heart disease and was produced by Drs. Louisa Burns and Ralph W. Rice of Los Angeles. Dr. Burns was scheduled to attend the Boston meeting and present, in collaboration with Dr. Esther Smoot, an illustrated paper on "Microphotographs of Tissue Pathology Following Vertebral Lesions." Illness prevented Dr. Burns' appearance, but Dr. Smoot read the paper and showed many slides illustrating the effects of osteopathic lesions on remote tissues.

The Andrew Taylor Still Memorial Address was delivered by Dr. R. C. McCaughan, Chicago, Executive Secretary of the Association. It is published as the lead article in this issue of THE JOURNAL.

SCIENTIFIC EXHIBIT

The Scientific Exhibit, under the direction of Dr. W. V. Cole, Kirksville, Mo., was outstanding for several reasons. The complete Photographic Salon of the American Association for the Advancement of Science was on display. An unusually interesting and informative exhibit from the Department of Anatomy of the Philadelphia College of Osteopathy attracted many visitors. This was erected by Dr. Angus G. Cathie, head of the department. In addition there were a number of view boxes exhibiting hundreds of pictures of pathological specimens in color. This was arranged by Dr. A. P. Ulbrich of Highland Park, Mich. Completing the scientific exhibit was a display by the Kirksville College of Osteopathy and Surgery prepared by Drs. Korr and Cole, results of plastic

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St. Joseph, Mo.
(re-elected)

Trustees Elected for Three Years

surgery by Dr. A. B. Crites, Kansas City, Mo., and exhibits loaned by the American Cancer Society, National Foundation for Infantile Paralysis, and the National Society for Medical Research.

OFFICIAL SESSIONS

The Board of Trustees convened July 14 and worked steadily each day and often far into the night until the opening of the House of Delegates on Sunday, July 18. Following the report of the Bureau of Professional Education and Colleges, the Board approved the six osteopathic colleges for the coming year. After hearing the report of the Bureau of Hospitals and Committee on Hospital Inspection, the Board approved 62 osteopathic hospitals for the training of interns. In addition, 25 of these hospitals were approved for a total of 107 residencies in the specialties. One hundred and five osteopathic hospitals were placed on the registered list. The names of both the intern training and registered hospitals will be published in the September JOURNAL.

The Board voted $28,948.56 for osteopathic research in osteopathic colleges and for support of the work of Dr. Louisa Burns in Los Angeles. Dr. Burns' new book, "Pathogenesis of Visceral Disease Following Vertebral Lesions" went on sale during the convention. All of the 200 autographed copies were sold and orders were received for future delivery.

Distinguished service certificates were awarded to Dr. C. Robert Starks of Denver and Dr. William E. Waldo of Seattle, for accomplishments in general organization activities. Both of these doctors are past presidents of the Association—Dr. Waldo was president in 1920 and Dr. Starks in 1944 and 1945.

The House of Delegates adopted with certain changes the Public Education on Health Manual which was presented for study at the convention in Chicago in 1947 and was the subject of a conference of divisional society leaders in February, 1948.

ELECTIONS

The House of Delegates elected Dr. H. Dale Pearson, Erie, Pa., President-Elect to take office in 1949. Dr. Forest Grunigen, Los Angeles, was named First Vice President; Dr. Vernon F. Still, Elizabeth, N. J., re-elected Second Vice President; and Dr. Mary E. Golden, Des Moines, Iowa, elected Third Vice President.

The trustees for a 3-year term are: Dr. John W. Mulford, Cincinnati, Ohio, formerly First Vice President; Dr. Floyd F. Peckham, Chicago, re-elected; Dr. Hooker N. Tospon, St. Joseph, Mo., re-elected; Dr. Alexander Levitt, Brooklyn, N. Y., and Dr. Hobert C. Moore, Bay City, Mich.

Dr. David E. Reid, Lebanon, Ore., was elected a trustee for 2 years to fill the unexpired term of Dr. Charles H. Beaumont, deceased.

Trustees for 1 year are: Dr. Allan A. Eggleston, Montreal, Que., Canada, re-elected; and Dr. Robert D. McCullough, Tulsa, Okla.

Dr. A. W. Bailey, Schenectady, N. Y., and Dr. Charles W. Sauter, II, Gardner, Mass., were re-elected Speaker and Vice Speaker, respectively, of the House of Delegates.

AUXILIARY AND OTHER ALLIED SOCIETIES

The Auxiliary to the American Osteopathic Association and its House of Delegates held meetings in

DR. ROBERT D. McCULLOUGH
Tulsa Okla.
Trustee for One Year

DR. ALLAN A. EGGLESTON
Montreal, Que., Canada
Trustee for One Year (re-elected)

DR. R. C. McCAUGHAN
Chicago
Executive Secretary

MISS ROSE MARY MOSER
Chicago
Treasurer (re-elected)

DR. ALBERT W. BAILEY
Schenectady, N. Y.
Speaker, House of Delegates (re-elected)

DR. CHARLES W. SAUTER, II
Gardner, Mass.
Vice Speaker, House of Delegates (re-elected)

DR. C. N. CLARK
Chicago
Business Manager (re-elected)

DR. R. E. DUFFELL
Chicago
Editor (re-elected)

the Copley Plaza Hotel at the same time as the parent organization. Mrs. G. N. Gillum, president, presided. On the final day of Auxiliary activities Mrs. R. K. Homan of Highland Park, Mich., was installed as president for the ensuing year. Mrs. D. D. Waitley, Evanston, Ill., was elected president-elect. The other officers are: First vice president and program chairman, Mrs. Sam H. Leibov of St. Louis; second vice president in charge of public relations, Mrs. T. H. Lacey of Parkersburg, W. Va.; secretary-treasurer, Mrs. Henry Watchpocket of Detroit.

At the meeting of the Society of Divisional Secretaries July 16 and 17, Mr. Dwight S. James, Des Moines, Iowa, secretary-treasurer of the Iowa association, was elected president; Dr. Roswell P. Bates, Orono, Me., vice president; and Dr. David E. Reid, Lebanon, Ore., re-elected secretary-treasurer.

The Association of Osteopathic Publications elected Dr. E. J. Elton, Wauwatosa, Wis., president; Dr. C. W. Vogler, Delray Beach, Fla., vice president; and Dr. R. E. Duffell, Chicago, secretary-treasurer, re-elected.

CLOSING CEREMONIES

On the closing day of the convention, Dr. Stephen M. Pugh of Everett, Wash., was installed as president for the year 1948-49. Executive Secretary, Dr. R. C. McCaughan, gave a summary of Board and House actions during the week. Dr. R. McFarlane Tilley, Brooklyn, was presented with the distinguished service award of Psi Sigma Alpha (national osteopathic scholastic fraternity). The presentation was made by Dr. W. D. Blackwood of Comanche, Tex.

1949 AND 1950 CONVENTIONS

St. Louis was approved by the House of Delegates as the convention city for 1949 and the opening date as July 11. Dr. C. D. Swope, Washington, D. C., was selected by the Board of Trustees to deliver the Andrew Taylor Still Memorial Address in 1949. Dr. K. R. M. Thompson, Chicago, is Program Chairman for the St. Louis convention and a preliminary meeting of the 1949 convention program committee was held in Boston.

According to the Bylaws, the convention site for 2 years hence may be chosen. The House voted to accept the invitation from Chicago for 1950, the opening date July 18. President-Elect Dr. H. Dale Pearson appointed Dr. William A. Ellis of Grand Rapids, Mich., as 1950 Program Chairman.

THE YEARLY INDEX

This issue of THE JOURNAL contains fourteen pages devoted to the yearly index which may be found following the final page of advertisements. The index is divided into three principal parts: an Author Index, a Subject Index and a Current Literature Department.

Under the Subject Index all reading matter published in THE JOURNAL during the past year (September, 1947, to August, 1948) is listed according to subject and cross-indexed for easy reference. The Subject Index contains also a list of books reviewed, arranged by author and by subject, a record of conventions and meetings, and a separate Legal and Legislative Index.

The compilation is the work of Katherine Becker, assistant editor.

Department of Public Relations

CHESTER D. SWOPE, D.O.
Chairman
Washington, D. C.

EXAMINATION FOR REGULAR CORPS OF U. S. PUBLIC HEALTH SERVICE

A competitive examination for appointment in the Regular Corps of the United States Public Health Service in the grade of assistant surgeon (first lieutenant) and senior assistant surgeon (captain) will be held in October. The written examination will be conducted October 4, 5, and 6 at places convenient to the candidates. The oral examination will be held at various points throughout the country.

All applicants must be at least 21 years of age and citizens of the United States, must present a diploma of graduation from a recognized medical school* and satisfactorily pass a physical examination performed by Public Health Service officers.

Physicians beginning internship on July 1, 1948, will be admitted to the examination. Successful candidates will be placed on active duty in the Regular Corps upon completion of internship on July 1, 1949.

Applicants for the grade of asssistant surgeon must have had at least 7 years of educational and professional training or experience, exclusive of high school. Applicants for the grade of senior assistant surgeon must have had at least 10 years of educational and professional training or experience, exclusive of high school.

Entrance pay for an assistant surgeon with dependents is $5,011 a year and for senior assistant surgeon with dependents $5,551 a year. This includes the additional pay of $1,200 for medical officers, as well as subsistence and rental allowance. Provisions are made for promotions at regular intervals up to and including the grade of senior surgeon (lieutenant colonel) and for selection for promotion to grade of medical director (colonel) at $9,751 a year. Retirement is authorized at either completion of 30 years' service or at the age of 64. Full medical care including disability retirement at three-fourths pay is provided.

Application forms may be obtained from Public Health Service Hospitals, District Offices or by writing to the Surgeon General, United States Public Health Service, Washington 25, D. C.

BILLS IN CONGRESS

HR. 1275—Authorizes treatment of naval officer personnel by civilian physicians where Government medical services are not available. House debate demonstrates osteopathic coverage. Public Law 511, approved May 4, 1948.

HR. 1943—Relates to Army and Navy Nurse Corps. Public Law 36, approved April 16, 1947.

HR. 2045—Amends Federal Food, Drug, and Cosmetic Act. Public Law 16, approved March 10, 1947.

HR. 2659—District of Columbia, alcoholics. Public Law 34, approved August 4, 1947.

HR. 2700—Federal Security Appropriation Act for Fiscal Year Ending June 30, 1948. Reenacts nondiscriminatory provisions relating to persons licensed to practice obstetrics in the States, applies to Social Security and EMIC obstetrical program. Public Law 165, approved July 8, 1947.

HR. 3215—Establishes Army-Navy Medical Services Corp (does not relate to Medical Corps). Public Law 337, approved August 4, 1947.

HR. 4114—Relates to certain Public Health Service expenditures. Public Law 781, approved June 25, 1948.

HR. 4636—District of Columbia Healing Arts Practice Act. Provides for acceptance of certificates from national examining boards. Public Law 488, approved April 20, 1948.

HR. 4739—Amends Tariff Act to provide free entry for x-ray film. Public Law 490, approved April 20, 1948.

HR. 4816—Provides for minimum allotment of $100,000 annually to States, under Hospital Survey and Construction Act. Public Law 830, approved June 29, 1948.

*Includes colleges of osteopathy approved by the American Osteopathic Association.

HR. 6071—District of Columbia, sexual psychopaths. Public Law 615, approved June 9, 1948.

HR. 6234—Authorizes VA residencies and internships. Public Law 722, approved June 19, 1948.

HR. 6339—Amends Hospital Survey and Construction Act to permit States to qualify for allotments by State legislation passed subsequent to July 1, 1948, prescribing standards of maintenance and operation for hospitals receiving aid under the Federal Act. Public Law 723, approved June 19, 1948.

HR. 6355—Federal Security Appropriation (supplement) for fiscal year ending June 30, 1949. Reenacts provision prohibiting discrimination against licensed practitioners of obstetrics. Provision for $132,000 for demonstrating effectiveness of a scholarship program to provide doctors for practice among underprivileged groups in areas where need for doctors is most acute, through award of undergraduate medical scholarships, passed the Senate but was deleted in Conference. Public Law 646. Passed over President's veto June 16, 1948.

HR. 6598—District of Columbia, insane, hospitalization. Public Law 861, approved June 30, 1948.

HR. 6653—Mr. Kersten of Wisconsin. Amends Public Health Service Act (1) for dissemination of pertinent facts concerning leprosy, (2) to provide for treatment of leprosy patients, (3) creating National Advisory Council on Leprosy consisting of the Surgeon General and nine members, six to be leading medical authorities and three to be nonmedical, (4) rehabilitation and reemployment of leprosy patients, (5) financial assistance for leprosy patients and their dependents, (6) compensation for disability incident to leprosy, (7) expansion of leprosy research.

HR. 6712—Revenue Revision Act of 1948. Relieves necessity of making returns by corporations tax exempt under Section 101(6) whose gross receipts are less than $25,000 "from sources other than dues or assessments (not including service charges), tuition, and gifts or contributions," if an educational organization normally maintaining regular faculty and curriculum and having regularly organized student body in attendance, or if a charitable organization primarily supported by contributions of the general public. The section of the Internal Revenue Code amended is Section 54(f). Passed House June 19, 1948.

HR. 6726—Mr. Brehm of Ohio. Amends Public Health Service Act to create a National Institute of Dental Research. Public Law 755, approved June 24, 1948.

HR. 6728—Mr. Weichel of Ohio. Amends Public Health Service Act to broaden existing authority for medical and hospital service for persons employed in the Maritime Service. Passed House June 8, 1948.

HR. 6729—National Heart Act. Superseded by S. 2215 (Public Law 655).

HR. 6732—Mr. Stevenson of Wisconsin. Amends Public Health Service Act to include National Institute for Poliomyelitis. Favorably reported to House June 2, 1948.

HR. 6777—Mr. Reed of New York. Social Security Act amendments of 1948. Extends coverage of Old Age and Survivors Insurance system to include employees of nonprofit organizations under voluntary minimum 5 year waiver (exclusive of 2 years' notice of withdrawal) by the employer. Passed House June 14, 1948.

HR. 6815—Mr. Meade of Kentucky. Extends VA medical and hospital benefits for service in time of peace.

HR. 6879—Mr. Eberharter of Pennsylvania. Social Security Act amendments of 1948.

HR. 7005—Mr. Fulton of Pennsylvania. Amends Public Health Service Act to create a National Multiple Sclerosis Institute.

The following bills are the same as HR. 7005: HR. 7014, Mrs. Bolton of Ohio; HR. 7015, Mr. Corbett of Pennsylvania; HR. 7016, Mr. Eaton of New Jersey; HR. 7018, Mr. Pfeiffer

(Continued on page 651)